

An Outbreak of Outbreaks: Noroviruses Hit Hard Across Indiana

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Such a tiny pathogen has generated big news recently, infecting hundreds of cruise ship passengers and forcing the closure of hospital wards across Canada, Great Britain, and Australia. Indiana residents are not immune, either. Since the beginning of November, six viral gastroenteritis outbreaks have been investigated in a variety of settings, including one restaurant, one outbreak in two sister hospitals, and six long-term care facilities. In addition, 23 suspected outbreaks have been reported from long term care facilities across the state. These are only the *reported* outbreaks.

Norwalk-like viruses, now classified under the genus *Norovirus*, cause an estimated 23 million infections, 50,000 hospitalizations, and 300 deaths among Americans each year¹ and are the leading cause of gastroenteritis outbreaks.² The classic symptoms of nausea, vomiting and diarrhea appear approximately 12-48 hours (average 30-36 hours) after exposure and resolve within approximately one to four days. Other symptoms may include abdominal cramps, headache, body ache, low-grade fever, and chills. Dehydration may result after prolonged vomiting and diarrhea, and reported deaths usually result from complications of dehydration or underlying medical conditions.

At least 23 types of noroviruses can infect humans. The virus is shed in stool and transmitted via the fecal-oral route. This occurs when someone uses the toilet and does not wash hands, then touches food, beverages, other people, or common surfaces or objects. Another means of transmission can occur when aerosols of vomitus are inhaled.² Fewer than 100 viral particles are needed to transmit infection, and the virus can remain inert on surfaces for several days. The virus can remain stable in chlorination levels up to 10 parts per million, survives freezing, and survives heating up to 60°C.¹

Although infection from noroviruses can occur anytime of year, there is a seasonal peak that begins in November and continues throughout the winter months. This has been observed in Europe, where this illness is known as “winter vomiting”, and according to recent outbreak data, here in Indiana as well. Figure 1 shows the number of confirmed and suspected outbreaks of viral gastroenteritis investigated in Indiana from 2000-2002. In 2002, the ISDH Epidemiology Resource Center began conducting surveillance of incident reports of suspected viral gastrointestinal illness. Figure 2 shows the pattern of these reports received during the year. This seasonality may be due to the fact that greater numbers of people maintain closer physical contact indoors throughout the winter months, especially during the holiday season. Holiday travel may also play a role. Greater numbers of people traveling longer distances can effectively transmit infection throughout different areas of the US and across the globe, as witnessed by the recent infections among cruise ship passengers.

Figure 1.

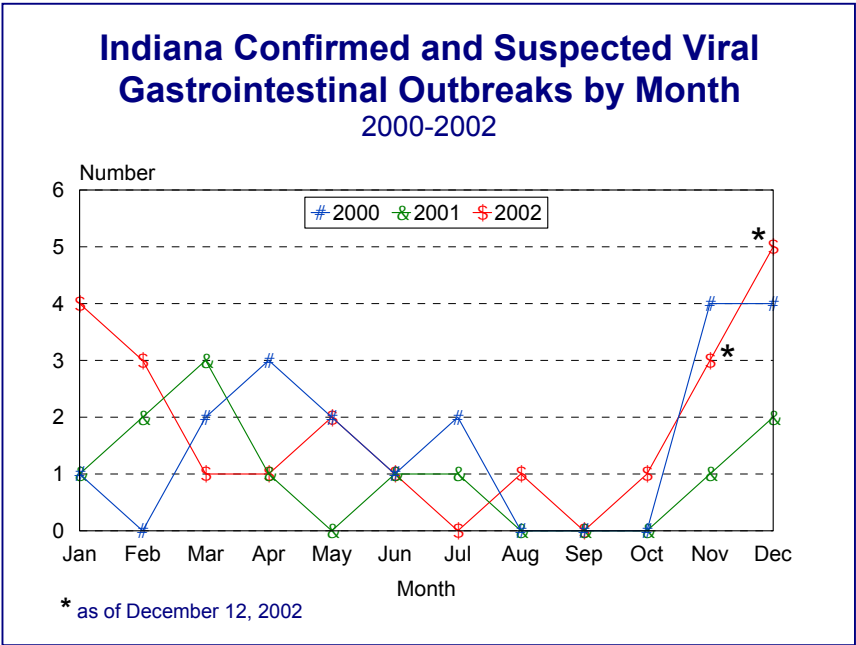
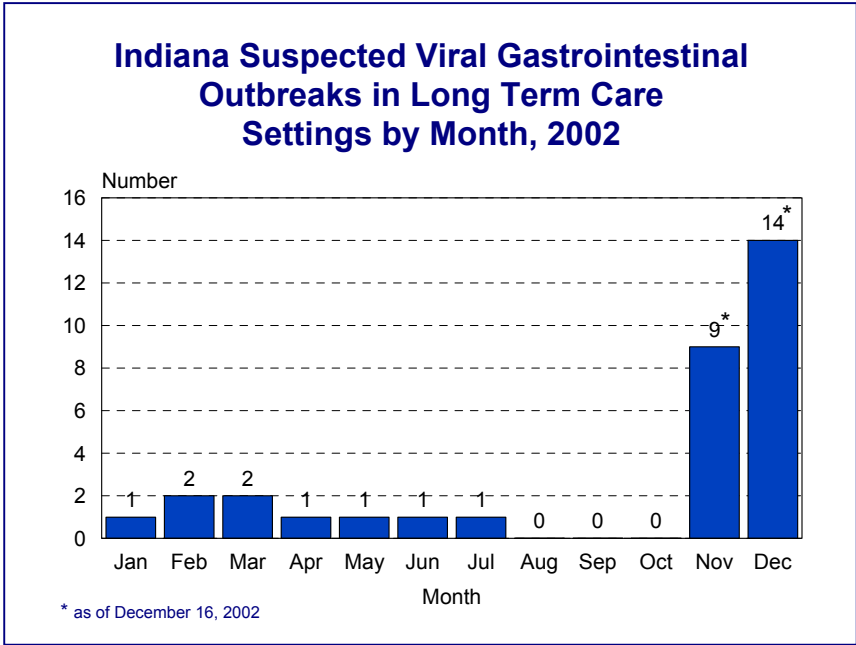


Figure 2.



Even with the current seasonality, norovirus infection has been particularly prevalent this year. According to the Centers for Disease Control and Prevention (CDC), there may be a predominant emerging norovirus strain. Since January 2002, 21 outbreaks of acute gastroenteritis on cruise ships have been reported, compared with seven outbreaks reported in 2001. Nine of these outbreaks were confirmed as norovirus outbreaks by laboratory testing. According to genetic sequencing analysis, four of these outbreaks were caused by the same viral strain. In addition, of the 29 non-cruise ship norovirus outbreaks CDC confirmed this year, five were caused by the same strain found in the four cruise ship outbreaks. These outbreaks occurred in North Carolina, Kentucky, Georgia,

and Utah. An additional five outbreaks caused by the same strain were also reported in Michigan. No sequencing data are currently available for the Indiana outbreaks.

As recent outbreaks have indicated, the public health implications of norovirus infection are great. First, the virus requires a very low inoculating dose to transmit infection. Second, several strains exist, so exposure to one strain will not protect against exposures to other strains. Third, immunity appears to last only a few months, so it is possible to eventually be reinfected with the same strain. Fourth, the virus is extremely environmentally stable and can remain infective on surfaces for several days. Finally, people may continue to shed virus up to two weeks after symptoms have ceased.

For these reasons, introduction of Norwalk-like virus into closed populations, such as hospitals and long term care settings (and cruise ships), can pose significant infection control challenges. Information regarding infection control measures in hospital and long term care settings may be found in a recent article in the *Journal of Hospital Infection* (2000) 45:1-10, "Management of hospital outbreaks of gastro-enteritis due to small round structured viruses".³

In any setting, there are several ways to help prevent the spread of infection:

- Wash hands thoroughly with soap and running water
- after using the restroom
- after changing diapers
- after assisting someone to use the restroom
- after assisting someone who is ill
- before preparing food
- before eating
- Exclude ill people from preparing food or providing medical or childcare.
- Exclude ill children from daycare and school.
- Do not attend work or social events while ill.

The ISDH actively investigates outbreaks of viral gastroenteritis. To report an apparent outbreak, please call the ISDH Epidemiology Resource Center at (317) 233-7125.

References

¹Centers for Disease Control and Prevention. *Morbidity and Mortality Weekly Report*, "Outbreak of Acute Gastroenteritis Associated with Norwalk-Like Viruses Among British Military Personnel – Afghanistan, May 2002." June 7, 2002 / 51(22);477-479.

²Centers for Disease Control and Prevention. *Morbidity and Mortality Weekly Report*, "Outbreaks of Gastroenteritis Associated with Noroviruses on Cruise Ships – United States, 2002." December 13, 2002 / 51(49); 1112-1115.

³Chadwick, P.R., et al. Report of the Public Health Laboratory Service Viral Gastro Enteritis Working Group: Management of hospital outbreaks of gastro-enteritis due to small round structured viruses. *Journal of Hospital Infection* (2000) 45: 1-10.
